

Accelerator Systems Division Highlights Ending May 13, 2005

Installation

Craft Snapshot 5/10/05

ASD productive craft workers	69.0
Foremen (Pd by 15% OH)	7.0
AMSI management (Pd directly)	3.0
TOTAL AMSI WORKERS	79.0
Less WBS 1.9, 1.2 etc	16.0
Less absent	5.0
TOTAL PD BY ASD/ORNL DB WPs	48.0

Accelerator Physics

- The physics group prepared 22 PAC papers and presentations, four of which are oral presentations (three invited).
- Beam output for the presently achieved SCL cavity gradients was evaluated. Even operating at 80% of achieved gradients and with 3 missing cryomodules, an output energy of ~ 850 MeV should be achievable.
- Application development is initiated for automated SCL retuning. Two applications are involved, one calculates transverse and longitudinal tunes for arbitrary klystron failure(s) and another steps through the cavity tuning process to facilitate these new settings

Operations

Ion Source

- A new, two-temperature Cs collar is being tested on the ion source test stand. It allows for controlling the temperature of the collar with the Cs dispensers while maintaining a surface near the outlet aperture at a different temperature. Initial operation with 50 kW of 2 MHz generates 1.23 ms long, 40 mA beam pulses at 5 Hz. The 24 hour operation is monitored by the Central Control Room.
- Calculations have shown that the 0.25 mm slit widths used in our emittance scanners increases the measured emittance by 1% or less. Wider slit widths are not advisable because the apparent emittance increases with the square of the widths, and corrections may be of questionable accuracy.
- Two papers have been submitted to PAC'05

Survey and Alignment

- Cryo Module 22, re-aligned
- Cryo Module 02, re-aligned
- Warm Section SR01 re-aligned
- Warm Section SR02 re-aligned
- Laid out 40 additional SCL bolt holes
- HEBT 12Q45 QV23 re-aligned and 12Q45 Qh24 re-aligned
- Continued analysis of BNL information in support of Ring Injection component placement and alignment.
- Laid out 72 bolt holes in support of diagnostic's support stands in RTBT.
- Two 21Q40/27CD30 combinations assembled.
- 21Q40-33 optically set and fiducialized
- Laser Tracker #677 failed. Probably cause is laser module. Tracker has been disassembled for shipment to factory for repair.
- 32 Beam Line #2 neutron guides fiducialized.
- Beam Line #2 guides mapped in place.
- Started alignment of Beam Line #4 Table fixture.

Mechanical

- CCL4 has been conditioned to full power and performed well.
- Visitors are here from INR in a collaboration to model the RCCS water systems for DTL3 and CCL2 to help in understanding and increasing the performance of these systems.

- A faulty ion pump connector has been replaced on the Front End RFQ and re-conditioning will likely begin this weekend.
- Diagnostic maintenance was performed on MEBT wire scanners in preparation for future runs.
- This week we assembled two RTBT 21Q assemblies and sent one to the tunnel. The other one is ready to go to the RTBT.
- We also mapped another RTBT 21Q40.

Electrical Group

HPRF

Ring RF

- Cooling water has been cycling through all four cavities.
- Cavity beam pipes are under full vacuum.
- A small vacuum leak was found in the second cavity and repaired. The leak was due to a bad plating spot on the vacuum seal.
- Waiting for electrical support to complete ring tunnel wiring

LLRF

Cryo Group

- Continued testing of superconducting cavities over the weekend
- Verified operability and determined limiting fields in open loop of an additional 14 cavities
- Operated 65 cavities simultaneously
- Average maximum gradient in open loop for 63 cavities is about 17.8 MV/m
- CM21 is ready to be tested
- Preliminary calculations of final linac energy, without the last two cryomodules, yield about 900 MeV with realistic gradients derived from the measured values.
- Cooled down CM22, leaked had to take it out the linac to be repaired
- Cooling down CM2 after been repaired

Controls

- Many controls group employees were busy completing papers and posters for the PAC, and at the same time submitting abstracts for ICALEPCS 2005.
- All (FY2005) Central Control Room work was completed this week by the contractor, DCS. The one outstanding piece of work is the installation of MPS crash buttons in the console south arc.
- In consultation with the original author (at Keck in Hawaii) work proceeded on correcting the serial software driver that has been the source of data dropouts in the SCL insulation vacuum system. Problems remain, and the final solution may be a complete rewrite. At the same time parts acquisition started for the hardware solution that is being pursued in parallel. The pressure reading error of RFQ Chiller has been resolved and it turns out to be a scaling problem. Several changes were made to the LLRF system. The features "rolled back" last week have been returned and the new system appears stable after a few days of running.
- A meeting was held with SCL, Vacuum, Operations, etc. to establish operational requirements for the SCL fast valves. We are now in a position to program the programmable logic device that implements the logic. A CPLD design has been written in VHDL so as to be readable and maintainable.
- Work continued on preparing the MPS system for the next run. The installation status for the SCL was reviewed. MPS screens and summary databases for the linac dump section were updated, some naming convention violations were fixed and PLC code was updated. .
- A motion control "overview" screen for the stripper "chainsaw" was created at BNL and submitted to CVS. This screen is not fully functional due to unknown calibration constants. The final calibration will be performed at ORNL, at which time the screen can be made fully functional.
- Due to changes made in LEDP and HEDP, some EPICS database and OPI changes have been made. The operator interface for the SCL vacuum control system has been completed and is ready for review.
- An initial cost estimate was prepared for the Power Upgrade Project (PUP).
- Ring and RTBT vacuum wiring drawings were completed this week.

- The Cesium Heater controller in the Hot Spare Ion Source was upgraded so that it will now operate up to 1000°C (instead of just to 600°C.) The Front End archive files were updated and some inconsistent names in the front end IOCs were fixed.

Beam Diagnostics